

WHAT IS CLAIMED IS:

1. A connection structure between optical fibers, comprising:
  - a substrate
  - a plurality of optical fibers each having end surfaces;
  - a base member provided over the substrate; and
  - a connecting part provided on a top surface of the base member and joined to each end surface of the plurality of optical fibers.
2. The connection structure between optical fibers according to claim 1, the plurality of optical fibers provided over the substrate.
3. The connection structure between optical fibers according to claim 1, the top surface of the base member being a flat surface.
4. The connection structure between optical fibers according to claim 1, the top surface of the base member being a curved surface.
5. The connection structure between optical fibers according to claim 1, the top surface of the base member making an acute angle with a surface that intersects the top surface at a side part of the base member.
6. The connection structure between optical fibers according to claim 1, an upper part of the base member being formed in a reverse-taper manner.
7. The connection structure between optical fibers according to claim 1, the base member being formed monolithically with the substrate.
8. The connection structure between optical fibers according to claim 1, only an end surface of a core being joined to the connecting part in at least one of the plurality of optical fibers.
9. The connection structure between optical fibers according to claim 8, in the at least one of the plurality of optical fibers where only the end surface of the core is joined to the connecting part, a height of the end surface of the core being different from a height of an end surface of a clad at an end part that is closer to the connecting part, of two end parts.
10. The connection structure between optical fibers according to claim 8, an end surface of the core protruding beyond an end of the clad.
11. The connection structure between optical fibers according to claim 8, the core and the clad forming a portion defining a convex portion at the end part.
12. The connection structure between optical fibers according to claim 1, a refractive index of the connecting part being larger than a refractive index of the clad of the plurality of optical fibers.

13. The connection structure between optical fibers according to claim 1, the refractive index of the connecting part being almost equal to a refractive index of the core of the plurality of optical fibers.

14. The connection structure between optical fibers according to claim 1, a surround of the connecting part being covered by sealant at an end part.

15. The connection structure between optical fibers according to claim 14, a refractive index of the sealant being smaller than the refractive indexes of the core of the plurality of optical fibers and the connecting part.

16. The connection structure between optical fibers according to claim 14, the refractive index of the connecting part being almost equal to the refractive index of the core of the plurality of optical fibers; and  
the refractive index of the sealant being almost equal to the refractive index of the clad of the plurality of optical fibers.

17. The connection structure between optical fibers according to claim 1, the connecting part being formed by hardening a liquid material that is hardened by applying energy.

18. The connection structure between optical fibers according to claim 17, the connecting part being formed of ultraviolet curing resin.

19. A connection method to couple optical fibers, comprising:  
(a) forming a base member over a substrate;  
(b) ejecting a droplet to a top surface of the base member to form a connecting part precursor; and  
(c) forming a connecting part by hardening the connecting part precursor while each end surface of a plurality of optical fibers is brought into contact with the connecting part precursor.

20. The connection method to couple optical fibers according to claim 19, further comprising:

(d) providing the plurality of optical fibers over the substrate.

21. The connection method to couple optical fibers according to claim 19, the connecting part precursor making contact with only an end surface of a core, in (c).

22. The connection method to couple optical fibers according to claim 21, in the plurality of optical fibers that make contact with the connecting part precursor, a height of the end surface of the core being different from a height of an end surface of a clad, in (c).

23. The connection method to couple optical fibers according to claim 19, the ejection of the droplet being implemented using an ink-jet method, in (b).

24. The connection method to couple optical fibers according to claim 19, the hardening of the connecting part precursor being implemented by applying energy, in (c).

25. The connection method to couple optical fibers according to claims 19, further comprising:

(e) covering a surround of the connecting part with sealant.

26. The connection method to couple optical fibers according to claim 19, the base member being formed monolithically with the substrate, in (a).